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L10	6	("5519825" "5628012" "5655067" "5706417" "5719786" "5867175").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/09/17 16:04
L11	12	particle adj animat\$4	US-PGPUB; USPAT; EPO; DERWENT	OR	OFF	2005/09/17 16:56
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L13	397	L12 and @ad<"20011027"	US-PGPUB; USPAT; EPO; DERWENT	OR	OFF	2005/09/17 16:56
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"particle animation"

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Particle Animation and Rendering Using Data Parallel Computation

K Sims - Computer Graphics, 1990 - portal.acm.org

Page 1. - Computer Graphics, Volume 24, Number 4, August 1990 **Particle Animation and Rendering ... 3 Particle Animation: A Particle Behavior Language ...**

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Approximate and probabilistic algorithms for shading and rendering structured particle systems

WT Reeves, R Blau - Proceedings of the 12th annual conference on Computer ..., 1985 - portal.acm.org

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Animation aerodynamics

J Wejchert, D Haumann - Proceedings of the 18th annual conference on Computer ..., 1991 - portal.acm.org

... 13 Karl Sims, **Particle animation** and rendering using data parallel computation,

ACM SIGGRAPH Computer Graphics, v.24 n.4, p.405-413, Aug. 1990. ...

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Modeling waves and surf

DR Peachey - Proceedings of the 13th annual conference on Computer ..., 1986 - portal.acm.org

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Real time design and animation of fractal plants and trees

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Design galleries: a general approach to setting parameters for computer graphics and animation

J Marks, B Andalman, PA Beardsley, W Freeman, S ... - SIGGRAPH, 1997 - portal.acm.org

Page 1. Design Galleries: A General Approach to Setting Parameters for Computer

Graphics and Animation J. Marks MERL B. Andalman Harvard Univ. ...

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A simple model of ocean waves

A Fournier, WT Reeves - Proceedings of the 13th annual conference on Computer ..., 1986 - portal.acm.org

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Surface modeling with oriented particle systems

R Szeliski, D Tonnesen - Computer Graphics, 1992 - portal.acm.org

Page 1. z Computer Graphics, 26,2, July 1992 Surface Modeling with Oriented

Particle Systems Richard Szeliskit and David Tonnesen\$...

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Solid spaces and inverse particle systems for controlling the animation of gases and fluids

DS Ebert, WE Carlson, RE Parent - The Visual Computer, 1994 - springerlink.com

Page 1. Solid spaces and inverse particle systems for controlling the animation

of gases and fluids David S. Ebert, Wayne E. Carlson, and Richard E. Parent ...
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Plant models faithful to botanical structure and development

P de Reffye, C Edelin, J Francon, M Jaeger, C ... - Proceedings of the 15th annual conference on Computer ..., 1988 - [portal.acm.org](#)
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[Dynamic Simulation of Splashing Fluids - O'Brien, Hodgins \(1995\) \(Correct\) \(8 citations\)](#)
 17, No. 3, pp. 359-376, 1983. 9] Sims, K. **Particle Animation** and Rendering Using Data Parallel
 to use this method for interactive computer **animation**. **Particle** systems have been used to model
www.gvu.gatech.edu/animation/Papers/obrien:1995:DSS.pdf

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 is given. 1.1. Previous work In computer **animation particle** and constraint systems have proven to be an
 of an implicit integration scheme for **animation**. **Particle** systems already represent a spatial
www.gris.uni-tuebingen.de/publics/paper/Hauth-2001-AHigh.pdf

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www-imagis.imag.fr/Publications/2001/PC01/paper.ps.gz

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 environment, CAVE, glyph, streamline, **particle animation**, raycasting, iso-surface. i ii
 Animated particles: the cParticlesFF class **Particle animation** is a dynamic version of the streamlines
www.science.uva.nl/research/scs/papers/./papers/archive/Ragas2002a.pdf

[Interactive Visualization of Volumetric Vector Fields.. - Guthe, Gumhold, Straßer \(2002\) \(Correct\) \(1 citation\)](#)
 the vector field direction only through the **particle animation**. The larger the particle and the more
www.gris.uni-tuebingen.de/publics/staff/././publics/paper/Guthe-2002-Interactive.pdf

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 The paper mentions that re-implementing the **particle animation** code on a serial computer would be
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ftp.cs.unc.edu/pub/publications/techreports/00-007.pdf

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[Flow Visualization on Hierarchical Cartesian Grids - Roettger, Schulz.. \(Correct\)](#)
 Fig. 6. The 4 side projections of a CAVE. 5 **Particle Animation** Reconsidering the basic visualization
 Figure 7) Fig. 7. Steps 1-3 of interactive **particle animation**. Furthermore, we extended the adaptive
www.vis.uni-stuttgart.de/~roettger/html/Main/././data/Papers/FLOWVIS.PDF

[Particle Flurries: a Case Study of Synoptic 3D Pulsatile.. - Jason Sobel Andrew \(2004\) \(Correct\)](#)
 VR to display a novel volume-filling **particle animation** of complex 3D flow together with a visually
 of seeds required to generate a synoptic **particle animation** of complex 3D flow by 93% over comparable
www.cs.brown.edu/research/vis/docs/pdf/Sobel-2004-PFC.pdf

[EUROGRAPHICS 2004 / M. Alexa and E. Galin Short.. - Antoine Bouthors Fabrice \(2004\) \(Correct\)](#)
 model is well suited to be integrated with **particle animation** and advanced rendering. Keywords: natural
www-imagis.imag.fr/Publications/2004/BN04/clouds-elec.ps

[The Computer Modelling of - Fallen Snow The \(Correct\)](#)
 41 3.3.1 **Particle Animation** and Rendering Using Parallel Computation .
 #Reeves 85# and water #Sims 90# 3.3.1 **Particle Animation** and Rendering Using Parallel Computation
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[Texture Particles: Interactive Visualization of.. - Guthe, Gumhold, Straßer \(2001\) \(Correct\)](#)
 the vector field direction only through the **particle animation**. The larger the particle and the more

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A Virtual Environment for Interactive Assembly Simulation.. - Looock, Schömer (2001) (Correct)
in the mid-80's. In the field of computer **animation particle** systems have found a broad range of
www.mpi-sb.mpg.de/~schoemer/publications/SCI01.ps.gz

Computer Animation - Francois Faure Computer (Correct)

3 Topics (continued) Physically-based **animation particle** systems -articulated bodies -other
www.cg.tuwien.ac.at/courses/Animation/A_Introduction.pdf

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July, 1985. Sim90] Karl Sims. **Particle animation** and rendering using data parallel
Phenomena 1. Particle Systems [Ree83] 2. **Particle Animation** and Rendering Using Data Parallel
www.cse.ucsc.edu/~wilhelms/262/papers.ps

Unknown - (Correct)

data is typically visualized by displaying a **particle animation** or streamlines. We present an efficient
(O(1))Keywords: volume visualization, **particle animation**, fluid flow, irregular grids, computational
www.accad.ohio-state.edu/~dreed/Papers/spie.ps.gz

(4) 1992, pp 4-16 101. Zeltzer D(1982) Motor Control.. - Ieee Computer (Correct)

Graphics 19(3)pp 245-254 78. Sims K(1990) **Particle Animation** and Rendering Using Data Parallel
www.cs.umbc.edu/~turner/publications/thesis/thesis7.ps

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IEE JNL IEE Journal or Magazine

IEEE CNF IEEE Conference Proceeding

IEE CNF IEE Conference Proceeding

IEEE STD - IEEE Standard

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Curington, I.;
Information Visualisation, 2001. Proceedings. Fifth International Conference on
25-27 July 2001 Page(s):317 - 322
Digital Object Identifier 10.1109/IV.2001.942076
[AbstractPlus](#) | Full Text: [PDF](#)(552 KB) IEEE CNF
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- ☐ 3. **Three ways to show 3D fluid flow**
van Wijk, J.J.; Hin, A.J.S.; De Leeuw, W.C.; Post, F.H.;
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- ☐ 4. **An interactive modeling method for dynamic natural objects**
Kabata, Y.; Nishino, H.; Utsumiya, K.; Korida, K.;
Systems, Man, and Cybernetics, 1999. IEEE SMC '99 Conference Proceeding
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- ☐ 5. **Fast display of illuminated field lines**
Stalling, D.; Zockler, M.; Hege, H.-C.;
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Volume 3, Issue 2, April-June 1997 Page(s):118 - 128
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- ☐ 6. **Texture mixing and texture movie synthesis using statistical learning**
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- ☐ **7. Modelling of smoke flow taking obstacles into account**
Yoshida, S.; Nishita, T.;
Computer Graphics and Applications, 2000. Proceedings. The Eighth Pacific C
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- ☐ **8. Using animated 3D graphical simulations to visualize semiconductor prin**
Smith, S.R.;
Frontiers in Education Conference, 1999. FIE '99. 29th Annual
Volume 2, 10-13 Nov. 1999 Page(s):12C5/24 vol.2
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- ☐ **9. Cloud simulation in virtual environments**
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14-18 March 1998 Page(s):98 - 104
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1 [Particle animation and rendering using data parallel computation](#)

Karl Sims

 September 1990 **ACM SIGGRAPH Computer Graphics , Proceedings of the 17th annual conference on Computer graphics and interactive techniques**, Volume 24 Issue 4

Full text available: pdf(5.82 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Techniques are presented that are used to animate and render particle systems with the Connection Machine CM-2, a data parallel supercomputer. A particle behavior language provides an animator with levels of control from kinematic spline motions to physically based simulations. A parallel particle rendering system allows particles of different shapes, sizes, colors and transparencies to be rendered with antialiasing, hidden surfaces, and motion-blur. One virtual processor is assigned to each pri ...

2 [Painterly rendering for animation](#)

Barbara J. Meier

 August 1996 **Proceedings of the 23rd annual conference on Computer graphics and interactive techniques**

 Full text available: pdf(180.73 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: abstract images, non-photorealistic rendering, painterly rendering, painting, particle systems

3 [Design galleries: a general approach to setting parameters for computer graphics and animation](#)

J. Marks, B. Andalman, P. A. Beardsley, W. Freeman, S. Gibson, J. Hodgins, T. Kang, B. Mirtich, H. Pfister, W. Ruml, K. Ryall, J. Seims, S. Shieber

 August 1997 **Proceedings of the 24th annual conference on Computer graphics and interactive techniques**


 Full text available: pdf(1.25 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: animation, computer-aided design, image rendering, lighting, motion synthesis, particle systems, physical modeling, visualization, volume rendering

Animation aerodynamics

Jakub Wejchert, David Haumann

July 1991 **ACM SIGGRAPH Computer Graphics , Proceedings of the 18th annual conference on Computer graphics and interactive techniques**, Volume 25 Issue 4

Full text available:  [pdf\(1.61 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Methods based on aerodynamics are developed to simulate and control the motion of objects in fluid flows. To simplify the physics for animation, the problem is broken down into two parts: a fluid flow regime and an object boundary regime. With this simplification one can approximate the realistic behaviour of objects moving in liquids or air. It also enables a simple way of designing and controlling animation sequences: from a set of flow primitives, an animator can design the spatial arrangements ...

Keywords: aerodynamics, animation, control motion design, flow primitives, fluid mechanics, leaves


5 Predicting the drape of woven cloth using interacting particles

David E. Breen, Donald H. House, Michael J. Wozny

July 1994 **Proceedings of the 21st annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(483.23 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

 [ps\(5.47 MB\)](#)

We demonstrate a physically-based technique for predicting the drape of a wide variety of woven fabrics. The approach exploits a theoretical model that explicitly represents the microstructure of woven cloth with interacting particles, rather than utilizing a continuum approximation. By testing a cloth sample in a Kawabata fabric testing device, we obtain data that is used to tune the model's energy functions, so that it reproduces the draping behavior of the original material. Photographs, ...

Keywords: Kawabata Evaluation System, cloth, drape, particle systems, physically-based modeling

6 Animating explosions

Gary D. Yngve, James F. O'Brien, Jessica K. Hodgins

July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(853.00 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we introduce techniques for animating explosions and their effects. The primary effect of an explosion is a disturbance that causes a shock wave to propagate through the surrounding medium. The disturbance determines the behavior of nearly all other secondary effects seen in explosion. We simulate the propagation of an explosion through the surrounding air using a computational fluid dynamics model based on the equations for compressible, viscous flow. To model the numerical ...

Keywords: animation, atmospheric effects, computational fluid dynamics, natural phenomena, physically based animation

7 Visual debugging of visualization software: a case study for particle systems

Patricia Crossno, Edward Angel

October 1999 **Proceedings of the conference on Visualization '99: celebrating ten years**

Full text available:  [pdf\(748.45 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Visualization systems are complex dynamic software systems. Debugging such systems is

difficult using conventional debuggers because the programmer must try to imagine the three-dimensional geometry based on a list of positions and attributes. In addition, the programmer must be able to mentally animate changes in those positions and attributes to grasp dynamic behaviors within the algorithm. In this paper we shall show that representing geometry, attributes, and relationships graphically p ...

Keywords: algorithm animation, particle systems, program animation, program visualization, visual debugging

8 Surface modeling with oriented particle systems

Richard Szeliski, David Tonnesen

July 1992 **ACM SIGGRAPH Computer Graphics , Proceedings of the 19th annual conference on Computer graphics and interactive techniques**, Volume 26 Issue 2

Full text available:  [pdf\(4.15 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: oriented particles, particle systems, physically-based modeling, self-organizing systems, surface interpolation

9 Animating prairies in real-time

Frank Perbet, Maric-Paule Cani

March 2001 **Proceedings of the 2001 symposium on Interactive 3D graphics**

Full text available:  [pdf\(799.80 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: levels of detail, natural phenomena, real-time 3D graphics

10 Computational fluid dynamics in a traditional animation environment

Patrick Witting

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(734.22 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: animation, animation systems, applications, fluid simulations, natural phenomena, numerical analysis, physically based animation, physically based modeling, scientific visualization, texture mapping

11 Modeling the motion of a hot, turbulent gas

Nick Foster, Dimitris Metaxas

August 1997 **Proceedings of the 24th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(5.92 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#)

Keywords: animation, convection, gas simulations, gaseous phenomena, physics-based modeling, smoke, steam, turbulent flow

12 Turbulent wind fields for gaseous phenomena

Jos Stam, Eugene Fiume

September 1993 **Proceedings of the 20th annual conference on Computer graphics and**

interactive techniques

Full text available:  [pdf\(184.71 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Fourier synthesis, advection-diffusion, gaseous phenomena, stochastic modeling, transport model of illumination, turbulent flow

13 Stable fluids

Jos Stam

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(1.33 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Navier-Stokes, advected textures, animation of fluids, gaseous phenomena, implicit elliptic PDE solvers, interactive modeling, stable solvers

14 Real-time simulation of dust behavior generated by a fast traveling vehicle

Jim X. Chen, Xiadong Fu, J. Wegman

April 1999 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 9 Issue 2

Full text available:  [pdf\(1.01 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

Simulation of physically realistic complex dust behavior is very useful in training, education, art, advertising, and entertainment. There are no published models for real-time simulation of dust behavior generated by a traveling vehicle. In this paper, we use particle systems, computational fluid dynamics, and behavioral simulation techniques to simulate dust behavior in real time. First, we analyze the forces and factors that affect dust generation and the behavior after dust particles are ...

Keywords: computational fluid dynamics, particle systems, physically-based modeling, real-time simulation, vehicle

15 Interactive visualization of flow fields

Allen Van Gelder, Jane Wilhelms


December 1992 **Proceedings of the 1992 workshop on Volume visualization**

Full text available:  [pdf\(975.97 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

16 Computer modelling of fallen snow

Paul Fearing

July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(3.72 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we present a new model of snow accumulation and stability for computer graphics. Our contribution is divided into two major components, each essential for modelling the appearance of a thick layer of snowfall on the ground. Our accumulation model determines how much snow a particular surface receives, allowing for such phenomena as flake flutter, flake dusting and wind-blown snow. We compute snow accumulation by shooting particles upwards towards the ...

Keywords: avalanches, natural phenomena, snow, stability

17 Modelling physical objects for simulation

Paula Sweeney, Alan Norton, Robert Bacon, David Haumann, Greg Turk
December 1991 **Proceedings of the 23rd conference on Winter simulation**

Full text available:  [pdf\(636.08 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**18 Cellular texture generation**

Kurt W. Fleischer, David H. Laidlaw, Bena L. Currin, Alan H. Barr
September 1995 **Proceedings of the 22nd annual conference on Computer graphics and interactive techniques**


Full text available:  [pdf\(268.98 KB\)](#)  [ps\(5.03 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



Keywords: bump mapping, constraints, data amplification, developmental models, displacement mapping, particle systems, texture mapping

19 Spot noise texture synthesis for data visualization

Jarke J. van Wijk
July 1991 **ACM SIGGRAPH Computer Graphics , Proceedings of the 18th annual conference on Computer graphics and interactive techniques**, Volume 25 Issue 4

Full text available:  [pdf\(8.67 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The use of stochastic texture for the visualization of scalar and vector fields over surfaces is discussed. Current techniques for texture synthesis are not suitable, because they do not provide local control, and are not suited for the design of textures. A new technique, *spot noise*, is presented that does provide these features. Spot noise is synthesized by addition of randomly weighted and positioned spots. Local control of the texture is realized by variation of the spot. The spot is ...

Keywords: flow visualization, fractals, particle systems, scientific visualization, texture synthesis

**20 Flow Visualization I: Rendering surface-particles**

Jarke J. van Wijk
October 1992 **Proceedings of the 3rd conference on Visualization '92**

Full text available:  [pdf\(747.45 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Surface-particles are very small facets, modeled as points with a normal. They can be used to visualize flow in several ways by variation of the properties of the particle sources. Here a new method is presented for the rendering of surface-particles. This method includes an improved shading model, the use of Gaussian filters for the prevention of spatial and temporal artifacts, an efficient scan-conversion algorithm, the handling of occlusion and the simultaneous rendering of geometric objects ...



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